

Thin-Film Superconducting Heat Switches Optimized for Low Power Consumption

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We have developed thin-film heat switches for trapping currents from 0.01A to 1.0A in thin film superconducting circuits. The switches have been optimized for low switching power while keeping the switching time for both on and off below 0.1ms. The switches were characterized in a vacuum attached to a temperature regulated stage whose temperature was varied from 1.4K to 4.2K. Several different switch designs have been characterized as a function of the operating temperature to study the effect of geometry and material choice on the switching time and power consumption. These switches are being developed for use in the Satellite Test of the Equivalence Principle (STEP) with support from NASA.

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